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FEBRUARY, 1939

Biography

DAVID IMRIE, M.R.C.V.S.

1888-1938.

IT has been said that the noblest occupation in this world is that of a teacher. By teaching his art to others he provides for the present and by handing on from his store of knowledge he enriches posterity.

A good teacher must be of modest demeanour, tolerant of the shortcomings of others, in love with his job and ever a student.

The work of a teacher can be accurately gauged by the estimation of his students, for the student mentality is critical and just.

Some teachers inspire fear, some gain respect, others are loved.

Of David Imrie it may be truly said that he has been feared by few but respected and loved by all.

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To him his students are of his family and he watches over their careers with the joy or sadness which is typical of a good father.

His influence is such that they one and all bear his stamp and they have carried what might be called "Imrieism" to all parts of the world. One often has to make excuses for the coining of a word, but no such excuse is necessary with regard to the above. "Imrieism" in the veterinary world stands for proficiency in the art which is based on diligence, sound observation, the constant search for knowledge and service to one's fellows.

It is doubtful if the value to a profession of such men as Imrie and his friend Harvey can be assessed too highly. Both are men from the same mould.

It is therefore a great pleasure to record that during the Glasgow conference of 1938 pupils from all parts of the world sought occasion to honour the jubilee of their friend and master, David Imrie, who to our good fortune is still with us and in fair health.

At a luncheon which was graced by the presence of his gracious wife, David Imrie was entertained by his friends, and presented with a piece of silver plate on which was inscribed the names of all his old pupils. To the oldest pupil, W. W. Lang, fell the honour of presenting this permanent token of their esteem and regard.

In rising to make the presentation, Mr. Lang said:

"To us, the old pupils and assistants of Professor Imrie, this is one of the greatest and most important occasions in our lives, meeting as we are to do honour to one whose influence has shaped our lives for good more than any other outside our respective family circles. We know that those unavoidably absent are with us in the spirit, and that those who have preceded us into the Great Beyond would gladly approve.

"Why mankind appears to wait until the object deserving of praise has ceased to be before proclaiming his virtues to the world has always been a mystery to me. 'Of the dead nothing but good' has been interpreted to include an injunction to say nothing in his favour while he is alive; surely this is all wrong.

"Apropos of this attitude, I was particularly impressed some time ago by a short poem which appeared in the *Sunday Express*. Slightly parodied for our purpose it runs:

'If with pleasure you are viewing any work a colleague's doing,
If you like him, if you trust him, tell him now.
Don't withhold your approbation till the parson makes oration
And he lies with snowy lilies o'er his brow.
For no matter how you shout it he won't really care about it,
He won't know how many tear-drops you have shed.
So if you think some praise is due him, now's the time to put it to him.
For he will not read his tombstone when he's dead.'

"We make no mistake; we have Professor Imrie with us to-day in order that we 'may tell him now,' that we may 'put it to him.'

"For three-quarters of a century the Spirit of McCall has prevailed. When he founded the Glasgow College in 1863 he asked the practitioners to give every facility to students to see practice, and this help was given freely and without hope of reward. To all intents and purposes Glasgow graduates still give free pupilage and the beneficent results of this to our profession are so incalculable and, speaking for myself, so binding that I cannot bring myself to break away from the old tradition. I have been told that I am wrong, but I cannot agree—I think too that the charging of pupilage fees will have serious repercussions. Surely it is our duty to pass on to others, free of monetary charge, those privileges we enjoyed from our predecessors.

"Our particular friend, Professor Imrie, took us raw, callow youths—I include myself in this category—and without obligation on his part placed his whole life's experience at our disposal. With wonderful patience he taught us to think and act for ourselves, quietly and gently pointing out our errors. 'Tell me what you think and I'll tell you what I think,' I can still hear him say though forty years have gone, and then he would proceed to invaluable constructive criticism of such a nature that one never experienced a sense of humiliation. Youth was always blind and it was not until years afterwards that I realised, as we all do now, what manner of man he is, a searcher after truth but no self-seeker, a born teacher, a great inspirer, humility personified. How often humility and greatness go together; he who is possessed of divine discontent is progressive and a valuable asset in any walk of life; and such a one is Professor Imrie.

"Professor Imrie's influence has spread throughout the world, and will remain; each of us is a faithful disciple and, so long as we live, we shall pass on his great teachings, and our successors will do likewise. Well do I remember during hot afternoons in Mesopotamia three younger men, an Englishman, a Canadian and a New Zealander, listening with rapt attention while I spoke—and I was preaching the gospel according to Imrie.

"One cannot say that he has been a prolific contributor to our journals, but he gave amongst others an article on 'Traumatic Indigestion in Cattle' of the greatest value. True, as he himself said, it was not altogether original, Arnold, of Idsten, having previously discussed the subject, but from his own experience and description he focused our attention on it in such a way that not only is it indelible but it has been the means of saving thousands of pounds annually to our stockowners. He has told me with pride how one practitioner whom he greatly respects was very sceptical at the time, but afterwards described the paper as the finest clinical contribution to which he had ever listened.

"We all look upon Professor Imrie as one of 'special eminence' in our profession, to quote the words of the Fellowship Diploma by election. When

the Royal College of Veterinary Surgeons received the power to grant this distinction I welcomed it, at the same time thinking that many would pass on before receiving the honour they deserved, as the number of recipients is limited to two per annum; but no awards have been made recently. Surely it is not because there are none others deserving?

" Words capable of expressing what we feel about our guest are not easily found, but Dr. McCunn has come to our aid and in a few well-chosen phrases has expressed the belief of all of us: 'I feel quite sure that nothing you or anyone else can say will adequately assess his value to his pupils and to his profession.'

" And what of the home to which we periodically return? Nowhere do we get a more gracious and kindly welcome than we receive from Professor Imrie, Mrs. Imrie and their family; it is as if our chairs were kept waiting for us. Truly we go *home* and the bonds are such that not only are we members of the family but each and all, older and younger, are brothers though many of us have never met.

" Dearly beloved David Imrie, we offer to you a token of our great love for you, a tangible expression of our admiration for you as a man, a thank-offering for your teaching, your inspiration and the many blessings you have showered upon us. May the days that remain to you be days of peace and may you experience that joy and that satisfaction which come to such as you whose life has been well spent in service to your fellow men." (Applause.)

Mr. Donald Campbell, who was next called upon to speak, said:

" Ladies and Gentlemen,

"When I heard from my friend Mr. Lang that Professor Imrie's old pupils had arranged to take this graceful way of signalising his jubilee in the profession I felt that I should like to join them in paying tribute to their teacher. I was not myself a pupil of Professor Imrie, and to some extent I feel myself to be an intruder in this intimate gathering, but I have known him long, and long admired him as a great clinician and an outstanding personality in the veterinary profession. Perhaps I may be allowed to speak as President for the time being of the N.V.M.A., and as such to try to convey to Professor Imrie something of the esteem in which he is held throughout the profession. It must be a great satisfaction to him to find that esteem indicated as it is to-day by those who have known him best.

" I shall not detain you from the luncheon that waits by making a speech, but I should like to associate myself to the fullest degree with all that has been so eloquently said by Mr. Lang. As you will understand, I have much to do this week, and with your permission I will now withdraw, but I look on it as a privilege to be present at this function, and in leaving I wish once again to assure you, Professor Imrie, of the warm regard that is felt for you by the whole profession."

The Late Mr. Henry Gray, M.R.C.V.S.

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On rising to reply, Professor Imrie was received with prolonged applause. His reply was in his usual modest vein and although under considerable emotional strain, he thanked his old boys for this their token of love and esteem to his wife and himself.

They were always in his thoughts and his reward for any service that he might have rendered was to see them go forth equipped for their life work, to watch them prosper and be a credit to their profession.

Mrs. Imrie, on being presented with a bouquet, remarked that "They made her feel like a young bride." What finer expression could any woman use?

Amongst the subscribers was Sir Frederick Hobday. On being told that he was not an old pupil he insisted that he was, for although he could not claim to be what might be called a personal pupil, as were the others, yet he was a pupil and his debt to Imrie was one which he could never adequately repay.

On behalf of the subscribers a tribute must be paid to Messrs. Abbott, Weipers and Ross, whose efforts ensured a successful and memorable meeting.

THE LATE HENRY GRAY, M.R.C.V.S.

MEMBERS of the profession will learn with regret of the death of Mr. Henry Gray, whose ardent championship on every possible occasion on behalf of the profession to which his life was devoted is so well known to all.

Born in 1865 of farming stock, he entered the London College as a student in January, 1882, taking his M.R.C.V.S. diploma in December, 1885 (as at that time the course could be completed in three years), and at once took up an assistanship in a colliery and general country practice at Culverton, near Nottingham. Two years later he came to the West End of London, settling down in Kensington, where he built up a large and lucrative practice amongst horses and dogs. At that time it was the custom to take contracts for veterinary attendance upon large studs, and of these Mr. Gray had his share, becoming well known for his skill in surgical operations. Eventually, as the horses grew less in numbers in the West End districts, he developed the small animal side of the practice, not refusing to give attention to the ailments of the fur-breeding animals and birds on which he became the leading veterinary authority.

Fond of study, he kept abreast of what was being done in other countries and his knowledge of the French language gave to the British veterinary profession a translation of a standard textbook in the French schools on "Diseases of the Eye," by Dr. Nicholas.

His presence and forcible oratory were well known at many gatherings of our professional Societies, and his knowledge of past literature, not only our own British works, but those of France and Germany, was proverbial—his memory in this direction scarcely ever being at fault. His private library contained a very valuable collection of textbook literature.

The Comparative Section of the Royal Society of Medicine found him one of its strongest original supporters and, until ill-health overtook him, it was rare for him to miss attendance at the meetings of the Central Society.

The death of Henry Gray leaves a gap which will be hard to fill and he will be much missed by a large circle of professional friends, which includes many of the younger generation, to whom he never refused his helpful advice.

Editorial

THE FIGHT AGAINST TUBERCULOUS MILK

ALTHOUGH still on its trial, as the promised twelve-month "reckoning up" of its working will not be made until after April, the value of the newly formed State Veterinary Service has already begun to be appreciated, not only from the public health and cleaner milk supply point of view, but also from that of the agriculturist, and especially those who possess dairy herds.

Although slow at first to respond to the appeal for the formation of "attested" herds, the owners of dairy cattle are now supporting it wholeheartedly, as will be shown by the following official statistics issued by the Ministry—comparing the numbers on June 30 with those of December 31, 1938. On the former date the figures were:

	Number of Attested Herds.	*Number of Cattle in Attested Herds.*
England and Wales	1,888 ...	79,000
Scotland	792 ...	61,000
Total, Great Britain ...	2,680 ...	140,000
And on December 31, 1938:		
England and Wales	3,529 ...	134,439
Scotland	1,109 ...	80,556
Total, Great Britain ...	4,638 ...	214,995

A very satisfactory increase and one which gives great promise of showing a greatly added result during the next twelve months, as much testing under Ministerial veterinary supervision is in progress.

Our medical colleagues are definitely in favour of the work which is being done by the Veterinary State Service, as there is no subject which demonstrates more the necessity for collaboration between the two branches of the profession of medicine than that of tuberculosis as a milk-borne disease, and for years the members of the veterinary profession have been trying to "hammer this home."

As recently as the 8th of this month the Minister of Health (Mr. Walter Elliot) and the Parliamentary Secretary to the Ministry (the Earl of Feversham), with a representative of the Department of Health for Scotland, received a combined deputation of delegates from the British Medical Association, the Royal College of Physicians and Surgeons, the Society of Medical Officers of Health, and the Joint Tuberculosis Council.

Sir Kaye Le Fleming (the Chairman of Council and Chairman of the Public Health Committee of the British Medical Association), in introducing the deputation, stated that there was a considerable amount of unsafe milk which was the cause of preventable disease, and that it was the opinion of the medical profession that effective pasteurisation offered the best safeguard.

This latter opinion was emphasised by each speaker who followed.

Professor G. S. Milne (Royal College of Physicians) stated that some 10,000 deaths from tuberculosis of bovine origin and about 2,000 cases of undulant fever — in addition to sixteen epidemics of milk-borne diseases (affecting some 3,400 people, with 67 fatalities)—had occurred during the past five years. He also drew attention to the observations made on calves, rats, mice and human beings which demonstrated that the damage done to the nutritive value of milk by pasteurisation was practically negligible.

Sir Wm. Savage (representing the Society of Medical Officers of Health), whose views on the subject are world-wide known, was especially insistent that individual pasteurisation orders should be laid before Parliament without delay; and Professor Picker (Chairman of the Public Health Committee of the British Medical Association) stated that he knew of no subject upon which doctors were so near unanimous.

The deputation hoped that power would be given to local authorities to exclude from sale all milk, other than from tuberculin-tested herds, which was not pasteurised or otherwise rendered safe by some form of heat treatment.

We are sure that the members of the veterinary profession will gladly welcome any steps which the Government may take to assist in this very vital problem, which not only helps the drinker of milk, but the health of the dairy cattle which produce it.

General Articles

CHINESE METHODS OF SPAYING AND CAPONISING

By W. ORR, M.R.C.V.S.,
Veterinary Officer, Perak

and CHEAH PHEE PHAY, G.M.V.C.
Veterinary Inspector, Batang Padang and Kampar, Ipoh

THE following observations on Chinese methods of spaying swine and caponising poultry were made in the Federated Malay State of Perak, where, as in the other States of the Federation and in the Straits Settlements, very large communities of Chinese have become established. The keeping of swine in Malaya is almost entirely in the hands of the Chinese, owing to the religious objection which Malays and other Mohammedan people have for this animal. The operations described hereunder are believed to be of considerable interest, their technique having been evolved at a very remote period in China, where they have been practised for centuries. The methods of securing and the operative technique have the simplicity of the truly ingenious. Chinese operators of to-day in Malaya maintain the traditional practice of their race and exhibit an extraordinary degree of operative skill and dexterity. These traditional methods had evolved and were mature centuries before a conception of aseptic surgery occurred, and they have been practised continually with a considerable degree of success, in spite of a total ignorance of the accepted canons of modern surgical usage.

Cantonese Method of Spaying Swine

The operation is performed at the time of weaning, when the pig is about two months of age, the average weight being between twenty and thirty katties (i.e., 26⅔ lbs. and 40 lbs. respectively). Pigs are given no food or water for about seven hours prior to operation. The instruments and apparatus required are as follows: two chisel-like knives with a blunt hook forming the extremity of the handle, a stout cord about fifteen feet in length, a wooden plank about six and a half feet long by about nine inches broad. The latter is leant against a wall with a sufficient slope to ensure reasonable

FIG. 1.—Pig secured: Cantonese method.

FIG. 2.—Operator about to make the incision: Cantonese method.

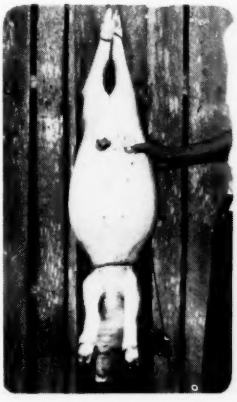

FIG. 3.—Uterine cornu drawn out through the incision: Cantonese method.

FIG. 4.—Knives used by Cantonese operator.

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stability. The cord is secured near the upper end of the plank in such a way as to allow a loop about a foot long to hang in the centre of the plank. The pig is secured by both hind pasterns to the dependent loop, from which the animal hangs head downwards, the back resting on the plank. The ventral surface of the pig's body is thus exposed for operation. The free end of the cord is passed downwards from its upper attachment, a half-hitch being taken round both plank and pig to secure the latter immediately behind the elbows. The operator then secures the free end of the cord to his right foot, which is held a few inches from the ground. By exerting traction on the cord with the right foot the operator while operating can increase or decrease the amount of control required to secure the pig without using his hands or calling upon the services of an assistant.

The pig having been secured in this way, the belly is wiped over with a cloth. A fold of skin and subcutis on the near side is held in the operator's right hand and lateral traction exerted, which draws the skin and subcutis covering the posterior part of the abdomen to the right. While maintaining this traction, the operator by deep palpation locates the uterus between the inguinal region and the two posterior mammæ on the near side. Palpation of the uterus through the abdominal wall is greatly facilitated by the position in which the pig is secured, the abdominal viscera tending to descend into the anterior part of the cavity against the diaphragm. The uterus having been located, the overlying skin and musculature is held firmly by the left hand, the right hand hold being released. A transverse incision about half an inch long is made at this site through the skin and abdominal musculature to the parietal peritoneum. The latter is punctured and torn by the hooked extremity of the operating knife, which is used for exploration and for securing the long flexuous uterine cornu. The latter is drawn through the incision until the ovarian extremity is reached. The cornu is then severed a few centimetres from the ovarian extremity. Severance is effected by the operator's finger nails, the action being both a tearing and cutting one. Considerable digital pressure is exerted on the severed extremity of the cornu. The second cornu is located by traction on the stump of the first, and the process of severance repeated. The ovarian attachment is severed in the same way. The stumps of the uterine cornua are pushed back into the abdominal cavity and the lips of the incision are firmly compressed to remove oozing blood. No sutures are applied. Hæmorrhage is negligible in young pigs at the customary age for spaying. There was no record of death having occurred as a result of the operation. Pyæmia is a not infrequent sequel of spaying in some parts of Malaya. Locally, however, it is extremely rare.

The initial lateral traction exerted on the skin prior to incision has the effect of placing the skin incision and that through the abdominal musculature in temporary apposition during the progress of the operation. When the

operator releases his hold of the parts the skin assumes its normal position, effectually closing the incision through the deeper structures. The risk of post-operative infection acquired through the atrium of the wound is therefore remote. No dressing is applied externally by the operator, though in some cases a mixture of kerosene oil and soot may be smeared on the site of incision by the owner of the pig. Owing to the tension exerted by the weight of viscera, the edges of the skin wound do not tend to unite directly. A small button-like citatrix forms as healing occurs. The fee charged by the operator is twenty-five cents per pig.

Hokkien Method of Spaying Swine

The operation is preferably carried out on weaners about three months of age. One operator who was interrogated stated that this operation could be carried out with safety on pigs six months of age, though it was preferable to operate at an earlier age. The instruments and apparatus required are as follows: two chisel-like knives with blunt hooked handles (similar to those used in the Cantonese operation), a stout cord about twelve feet in length, a heavy baton of wood about four feet in length, a reel of strong cotton secured in a waist-belt wallet in such a manner that a length of thread may be unwound with one hand, a large straight needle. The cord is secured to an end of the baton and the pig is laid upon it on its right side in such a way that the longitudinal axis of the body is at right angles to the baton. The pig is then secured by a turn of the cord from the end of the baton passing over the thorax immediately posterior to the elbow. The free end is tied to the baton and is passed forward to the pig's snout, round which several turns are taken, the head being drawn upward and backward toward the near side. The free end of the cord is again secured to the baton, upon which the operator places his right foot, having assumed a squatting position. His left foot is placed upon the near hind leg of the pig distal to the hock. In this position the pig is effectively secured by the cord, baton and the operator's feet. If increased tension is required owing to the struggles of the pig, the operator moves the free end of the baton with his left foot in such a manner as to decrease the angle between the long axis of the pig's body and that of the baton. Secured in the final position, the pig is lying half on its side and half on its back. The belly of the pig is rubbed over with a damp rag and the site of operation roughly shaved to remove bristles. A vertical (dorso-ventral) incision about one inch long is made through the skin and abdominal muscles from within about two inches of the fourth mammary gland on the near side. The peritoneum is punctured and torn by means of the blunt hook. The index finger of the operator is then introduced to locate the right uterine cornu, which is drawn out with the aid of the blunt hook. Both ovaries are exposed in turn and the ovarian attachment ligatured with cotton from the waist wallet. Ablation

FIG. 5.—Pig secured: Hokkien method.

FIG. 6.—Chinese operator caponising; the bird's legs and wings are held by the operator's toes.

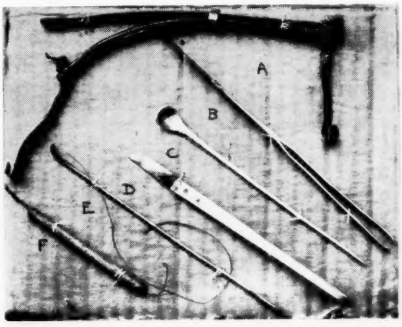

FIG. 7.—Instruments used in Chinese method of caponising: A, Speculum with sliding "lock" and metal hooks. B, Steel-bladed Scalpel with forceps handle of silver. C, Silver spoon curette with pointed probe handle. D, Steel-bladed scalpel with forceps handle of silver. E, Steel probe with attached fibre. F, hollow rotan "cannula" with snare.

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of the organ is effected with the knife. The skin incision and musculature are drawn together by means of a continuous suture. The time taken by one operator to complete the operation after securing the pig was about two and a half minutes. The fee charged for this operation is twenty-five to thirty cents per pig.

When the two methods of spaying are considered, the Cantonese appears to be the more efficient. In the first place the position in which the pig is secured is preferable. This position causes the descent of the mass of the viscera to the diaphragmatic portion of the abdominal cavity, thus facilitating external palpation of the uterus and surgical approach. The lateral traction on the skin exerted before incision, which results in the effective closure of the operative opening, renders the technique of this method superior to that of the Hokkien.

The spaying of swine by Chinese methods has been condemned as barbarous, and it has been suggested that steps should be taken to prohibit the practice under provision of the Prevention of Cruelty to Animals Enactment. It is assumed that such criticisms have arisen from a very meagre possession of the relevant facts and from a misunderstanding of the issue. There is an economic necessity underlying the spaying of swine which is recognised in all civilised countries. It is not possible for the Veterinary Department to undertake such work on account of a limited staff. The operations have been described in sufficient detail to convey an impression of the skill of the operators and the ingenuity of their methods. It can be concluded, therefore, that the operation is carried out in such a manner as to cause the minimum of suffering to the animals concerned. The Chinese pig rearers are accustomed to a very high level of efficiency in the operators they employ, and a slow or incapable spayer would not be employed by them.

Method of Caponising Fowls

As in the case of ovariotomy of swine by the Chinese methods already described, the technique in caponising fowls appears to be of remote antiquity in China. The instruments used are as follows: two scalpels with the handle part in the form of forceps—the blades are of steel and the forceps portion of silver—one cannula fashioned from a piece of hollow rotan through which a fibre thread is inserted to form a loop "snare" at one extremity, one steel probe with a bent extremity having an eye through which a fibre thread is inserted and secured, one silver spoon curette with a probe pointed handle, one speculum consisting of two pieces of flexible cane, an adjustable ring "lock" and two broad metal hooks attached to the extremities of one of the cane pieces. The latter are attached to each other at one end only. When in use the hooks are introduced to the operative opening, the single cane piece to which they are attached being bent to the requisite extent to allow introduction.

The adjustable ring lock is then moved away from the attached end of the cane pieces, bringing them into apposition, with a consequent increase in rigidity and tension on the hooks. The operator stated that his instruments were purchased in China and could not be procured locally.

The operator, having removed his footgear, seated on a low stool about five inches high (or on the ground), takes hold of the fowl and draws its wings backwards to bring them into apposition dorsally where they are secured by the toes of the operator's left foot while the legs of the bird are secured between the toes of the right foot. The bird in this position lies on its left side with its back towards the operator. The feathers are then plucked from the site of operation on the right abdominal wall bounded by the last rib, the transverse processes of the vertebræ and the anterior border of the thigh. A vertical incision is made through the skin and musculature about half an inch in length (depending on the age of the bird and size of testes) a little behind the last rib (compare with European method). The exposed parietal peritoneum is punctured with the probe and torn to correspond to the size of the incision after which the speculum is applied. The right testis is located by exploration with the probe and drawn towards the opening with the aid of the attached fibre. The loop of the cannula snare is then passed over the testis and the attachment of the latter severed by abrupt tension on the fibre. The testis is then removed with the spoon curette. If the testis is large severance is effected by exerting a sawing action with the loop. The second testis is located and ablated in the same manner, the speculum removed and a few of the plucked feathers put on the site of operation upon which the wing is pressed with the idea of keeping them in position. A spoonful of water is given to the fowl which is then released. The bird should be confined in a coop for two days after the operation. The fee charged is eight cents per bird.

SNAKEBITES IN HORSES AND MULES

By ROLF E. HARTIG, Dr. Med. Vet. (Zürich)

Paarl, Cape Province, South Africa.

PRACTITIONERS in and around the Cape Peninsula seldom have to be called in to treat cases of snakebites, and as there is a doubt as to the reliability of anti-venom serums on the market, I should like to publish the following experiences.

The S.A. Handbook for Farmers, 1937, an excellent official advice book for all farmers, speaking about animal diseases, says: "As we have no experimental evidence on which we could base the size of the dose of anti-venom serum for animals, we can only make the following suggestions in this respect —horses and cattle about four times the dose (as given to human beings)."

In my own experience I have either been called to do a P.M. in cases where the animal had been bitten in the mouth or I had been called to cases where the animal had been bitten in one of the legs. In the latter cases I found that the intravenous injection of 100 c.c. of a 3 per cent. Yatren solution was as a rule so successful that I did not consider it necessary to carry anti-venom serum as part of my regular outfit in the roomy dicky of my car, which covers approximately 3,000 miles a month.

On October 20, 1938 (i.e., the end of the rainy season and the beginning of the warm weather), I was called to attend two mules at Elgin—about 70 miles from my home. The one, a very wild animal, had been bitten in the head the day before and as there was considerable reduction of the swelling, it was left alone; the other one (illustration) showing very heavy swelling was given the Yatren injection. The first one died the next day, but the latter was still alive on the 22nd when I was again called to attend a horse bitten in the same way. Both animals received a 100 c.c. Yatren injection (i.v.) and both died during the following night. The proprietor, suspecting the animals might have been poisoned—possibly as an act of sabotage—ordered a very careful P.M. of both animals, which revealed that both animals had died as a result of a snakebite.

I then communicated with the local medical practitioner, Dr. Kerby, who kindly promised his assistance and we arranged that immediately a new case was reported a proper dose of anti-venom serum be given. A few days later Dr. Kerby rang me up and reported that another mule had been bitten in the mouth. He forthwith injected three doses and on the next day another two doses. Three doses originated from the Fitzsimmons Institute, Port Elizabeth, and the other two from the S.A. Medical Research Institute, Johannesburg. The injections were given just behind the shoulders on both sides. The animal fully recovered within a week and is working again. A couple of snakes were afterwards caught in the orchards.

Speaking about snakebites, I should, in addition, like to publish the following case. In the Paardeberg mountains, not far from Paarl, a farmer lost four valuable calves, one after the other. When the fifth was dead I was called for a P.M. with the following result—a snakebite near the navel. On inquiry I found all the other calves had died in the same way. The calves were sleeping during the night in an old roomy shed with plenty of wooden material stored round about. Shortly before four milk cows used to sleep in the same place, but were removed to an outside kraal. My conclusion was that there had been a dropping out of milk from the heavy milkers which attracted

the snake and, being accustomed to it, the snake tried to get something out of the calves and was obviously biting, disappointed with the negative result. Three months later I had the same case on another farm; removing the calves stopped the losses at once.

NOTES ON TWO CASES OF NATURALLY OCCURRING TOXOPLASMOSIS OF THE DOG IN BAGHDAD

By C. MACHATTIE, F.R.C.V.S., D.V.S.M., Dr. Med. Vet. (Zurich)*

Director, Veterinary Vaccine Lymph and Sera Institute, Baghdad.

UNDER the heading "*Sur une infection à corps de Leishman ou organismes voisins du gondi,*" Nicolle and Manceaux (1908) described a new parasite which they had discovered in the gondi (*Ctenodactylus gundi*). It bore a certain resemblance to leishmania, but later (1909) they established a new genus *Toxoplasma* for its reception. Since then species have been recorded from various mammals, several birds and a snake. The parasite of the gondi has been described at length by Chatton and Blanc (1917).

Though the organisms have been studied extensively the life history is still incompletely known, while attempts at culture have been quite unsuccessful.

Mello (1910) at Turin was the first to record a case of naturally occurring toxoplasmosis of the dog. The symptoms were pronounced anæmia, emaciation, dyspnœa, bloody diarrhœa and sensitiveness of the abdominal wall. At post-mortem examination a bloody serous exudate was found in the body cavities. Small nodules occurred in the lung tissue, similar nodules and round ulcers on the intestinal mucous membrane, moderate swelling of the spleen, a more pronounced swelling of the liver and a red coloration of the bone

* This paper is published by permission of Farooq Beg Al-Damlouji, Director of Veterinary Affairs, Iraq.

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marrow. Smears of the organs, blood, nodules and ulcers revealed oval or rounded bodies simulating leishmania. They were 1μ in diameter, possessed a chromatin nucleus and were either free or enclosed in large mononuclear cells. Carini (1911) described the canine parasite from Brazil, Yakimoff and Kohl-Yakimoff (1911) from Germany, Carini and Maciel (1915) from Brazil. Fedorovitch (1916) discovered it on the Black Sea coast. Blanc (1917) described a case in a dog from Tunis; the animal, which had been kept in the same building as a number of gondis among which toxoplasmosis had occurred, died without having shown any symptoms. Boez (1911) recorded a case in a dog from Strasburg. The next record is by Nicolau and Kopciowska (1935) who describe a toxoplasma infection of a dog in which the parasite occurred in the brain, spinal cord, spleen, liver, suprarenal capsule, lymphatic glands, lung, small intestine and heart. The parasites were most numerous in the upper part of the small intestine where almost every epithelial cell was invaded, the mesenteric lymphatics and the lungs.

Toxoplasmosis of Baghdad Dogs

While engaged on work on oriental sore the writer examined a healing sore on the nose of a street dog but no leishmania were present. The dog was emaciated, refused food and had difficulty in breathing. It died during the night. Smears from the spleen showed on first examination a microscopic picture closely simulating that of kala-azar. Closer study, however, showed that the parasites did not possess the definite kinetoplast which together with the nucleus is essential for the identification of leishmania. The parasite was considered to be a species of *Toxoplasma*. Smears were sent to Dr. Wenyon who confirmed the condition to be one of toxoplasmosis.

Parasites were most numerous in the lungs, larger schizont-like structures being found only in the lungs; single parasites and forms in binary fission were also found in the liver, spleen, submaxillary lymphatic glands, heart blood and muscle. No parasites were observed in smears from the brain, the spinal cord or the kidneys.

The post-mortem examination revealed congestion of the lungs and slight enlargement of the spleen. The liver and all other organs, including the bone marrow, appeared normal to the naked eye. There was no marked exudate in the abdominal or thoracic cavities.

About a week later a street dog which had been adopted and had rarely left the house was sent to the Veterinary Hospital for treatment of a disease which the owner diagnosed as tuberculosis. There was certainly wasting and dypsnœa, and complete loss of appetite; the temperature on arrival was 102° F. There was slight diarrhœa but no trace of blood. Smears of the peripheral blood showed no parasites other than a single intraleucocytic form of *Hepatozoon canis*.

The dog died during the night. At post-mortem examination, the only

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noticeable lesions were necrotic foci of the lungs and liver and hæmorrhagic areas, each of about 2 mm. in diameter, at the exit of the stomach.

Examination of smears showed many toxoplasmas indistinguishable from the parasites seen in the first case. The parasites were again most numerous in the lungs; they were also present in scrapings of trachea but absent from the brain, spinal cord and kidneys. Sections showed areas of necrosis of lung and liver with much cellular degeneration and liberation of parasites. Smears from the hæmorrhagic areas of the stomach showed numerous short broad spirochætes, which Dr. Wenyon considers to be probably *Spirochæta regaudi.*

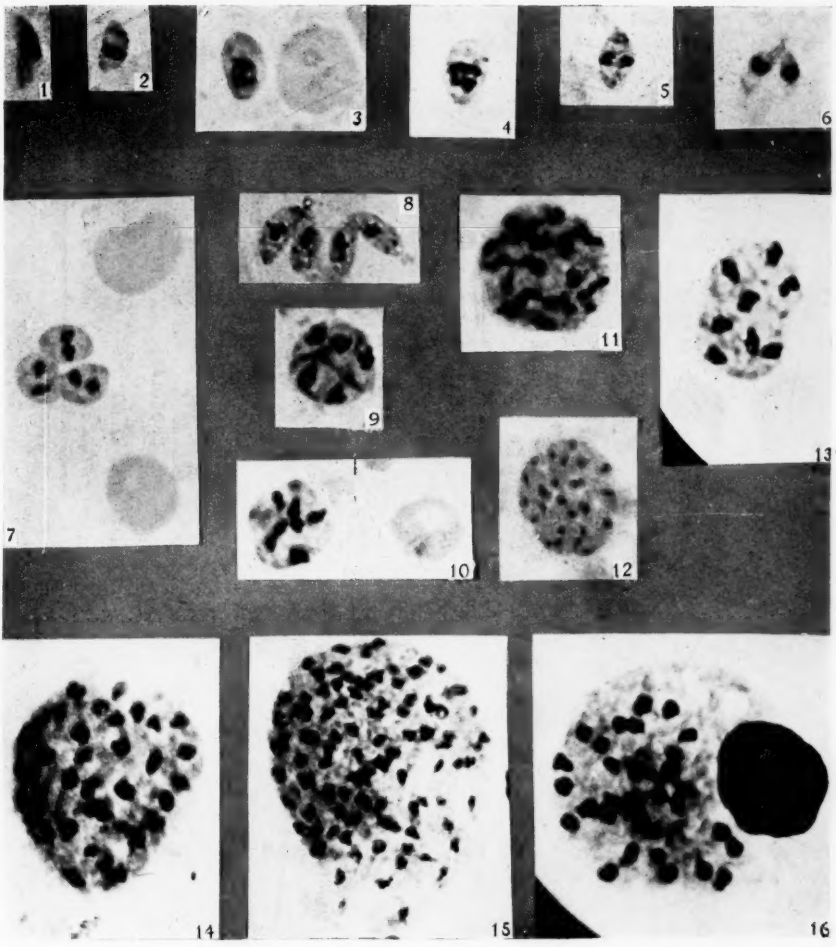
Morphology of the Parasite

The shape of the parasite is generally that shown in Figs. 1 and 2. The body may be straight or show a varying degree of curvature to a crescentic form; ovoid and pear shapes are common, round forms are rare. Parasites in which fission is just completed are prevalent (Figs. 6 and 8). There is no trace of flagellum, though a prolonged search will reveal a fine filament leaving the cytoplasm of the parasite, but, as in the case of *Leishmania tropica,* this is an artifact due to rupture of the cytoplasmic envelope or nucleus. The most noteworthy feature of toxoplasma is the complete lack of kinetoplast. Fig. 8 shows a group of dividing parasites, one appears to possess a kinetonucleus but this is due probably to the breaking loose of some of the chromatin of the nucleus. Frequently a single parasite is seen lying in a vacuole of the cytoplasm of a monuclear cell. As in the case of *L. tropica* the toxoplasms show a preference for mononuclear cells. Such cells may be packed with parasites as in Fig. 16. The size of the Baghdad species is variable; twenty typical forms measured from 4 to 6.5μ by 2 to 3μ. The parasite is compared for size with blood corpuscles in the accompanying microphotographs.

Multiplication

Toxoplasma is known to divide by binary fission (Figs. 1 to 6). There would appear to be a tendency for dividing forms to group (Fig. 7) and in the case of smears from the lungs of Baghdad dogs striking looking structures closely resembling schizonts are of frequent occurrence (Figs. 14 and 15).

A study of the literature leads one to suppose (Splendore, 1910) that schizogony occurs in the case of toxoplasma; and Chatton and Blanc (1917) illustrate the process. The general impression gained by the student of toxoplasmosis literature is that schizogony has been established as a method of reproduction of this parasite. The process, however, has not yet been clearly demonstrated. When isolated forms divide it is easy to recognise the binary fission process (Figs. 6 and 8), but with increase in the number of nuclei and loss in the cytoplasmic outline of individual parasites—a process particularly noticeable within cells (Fig. 16) it becomes an impossibility to ascertain if the process of multiplication is by binary fission or by schizogony. Thus Fig. 16



FIGS. 1 & 2.—Typical toxoplasma. FIGS. 3 & 4.—Swollen degenerating forms.
FIGS. 5 & 6.—Showing binary division.
FIG. 7.—Dividing toxoplasmas in process of grouping.
FIG. 8.—Dividing forms showing post-mortem degenerative changes, the form on the right shows a false kinetonucleus.
FIGS. 9, 10, 11, 12 & 13.—Masses of parasites which may have resulted either from binary fission or from schizogony.
FIGS. 14, 15 & 16.—Schizont-like structures showing the pear-shaped contour referred to in text.

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may represent either binary fission or schizogony within a cell, and Fig. 11 represents a detached portion of the cytoplasm of such a parasitised cell.

The question of structures closely resembling schizonts has already been drawn attention to by Wenyon (1926) in the case of leishmania.

Regarding toxoplasma of the Baghdad dog the writer has paid particular attention to the question of whether schizogony does or does not occur, but neither in smears nor in sections has proof of schizogony been definitely apparent. Dr. Wenyon, who has examined the material, points out that whereas there cannot be any doubt that toxoplasma divides by binary fission it would be quite unprecedented for a parasite to reproduce regularly both by binary fission and by schizogony.

Dr. Wenyon (1938) writes of the Baghdad parasite "*what I cannot find is a convincing series of intracellular forms from the single nuclear to the multinuclear stage.*"

The striking looking structures shown in Figs. 14 and 15 show a definite pear shape which has not previously been recorded in toxoplasmosis. These structures certainly resemble schizonts, but proof that they do not represent massed individual parasites in the cell is still lacking.

Factors which may Influence the Incidence of the Disease

A point which may influence the incidence of the disease is its seasonal occurrence. Thus Chatton and Blanc (1917) note that in toxoplasmosis of the gondi in Tunis the disease is distinctly and regularly seasonal in that it occurs during the coldest time of the year, that is, from October to the end of February. In Brazil, Splendore (1910), in the case of rabbit toxoplasmosis, reports the same peculiarity when account is taken of the inversion of the seasons. The Baghdad cases recorded in this paper occurred in March, after an unusually cold Baghdad winter, snow having fallen in February. Chatton and Blanc (1917) also draw attention to the prevalence of the disease in gondis housed at the Pasteur Institute in Tunis, and their failure to discover it in four hundred wild gondis. The ordinary Baghdad street dog has no home and no master. Of the two infected dogs the first had attached itself to a coffee shop establishment where it fed and slept, the second had been adopted as a lady's pet.

The occurrence within a fortnight of two fatal cases of canine toxoplasmosis in Baghdad gives one food for thought as to what is the actual incidence of the disease.

Conclusions

1. Two fatal cases of toxoplasmosis in Baghdad dogs are recorded.

2. Dyspnœa and wasting appear to be the chief symptoms. At post-mortem examination lungs and liver generally show lentil-sized necrotic foci.

3. Sections show the toxoplasma in the tissues within large endothelial

and other cells. Areas of necrosis are produced with much cellular degeneration and liberation of parasites.

4. Attention is drawn to the regularly occurring pear-shaped contour of large masses of parasites which closely resemble schizonts and which occur only in the lungs.

REFERENCES.

Blanc, G. (1917): *Bull. Soc. Path. exot., 10,* 377.
Boez, L. (1921): *C. R. Soc. Biol. Paris, 85,* 479.
Carini, A. (1911): *Ibid., 4,* 518.
Carini, A., and Maciel, J. (1913): *Ibid., 6,* 681.
Chatton, E., and Blanc, G. (1917): *Arch. Inst. Pasteur Tunis, 10,* 1.
Fedorovitch, A. (1916): *Ann. Inst. Pasteur, 30,* 249.
Mello, U. (1910): *Bull. Soc. Path. exot., 3,* 359.
Nicolau, S., and Kopciowska, L. (1935): *Ibid., 28,* 490.
Nicolle, C., and Manceaux, L. (1908): *C. R. Acad. Sci., 147,* 763.
Nicolle, C., and Manceaux, L. (1909): *Ibid., 148,* 369.
Splendore, A. (1908, 1909, 1910): *Rev. Soc. sci., S. Paulo, 3,* 109; *4,* 462; *5,* 167.
Wenyon, C. M. (1926): *Protozoology, 2.* London: Baillière, Tindall & Cox.
Wenyon, C. M. (1938): *Private Communications.*
Yakimoff, W. L. (1915): *Bull. Soc. Path. exot., 8,* 474.
Yakimoff, W. L., and Kohl-Yakimoff, N. (1911): *Ibid., 4,* 617.

Clinical Articles

PHARYNGEAL POLYPUS REMOVAL

By R. HUDSON, F.R.C.V.S.
Retford.

THE subject was a very large shire gelding.

For two or three months the animal had shown some throat trouble, difficult to describe and to find the cause of because he would not permit examination properly.

He made a rumbling noise when feeding, sometimes appeared to choke, would feed a bit and then put his nose up, continue to chew and swallow and sometimes cough, then begin at the manger again. Water was swallowed, but occasionally it and food juices trickled down the nostrils. When at work he had once or twice rolled on to the other horse.

Outwardly, the throat region was normal. The horse had lost condition lately.

Mr. Sampson, Sheffield, had passed a stomach tube and noticed that it was obstructed in the pharynx.

FIG. 1.—Condition when treatment commenced, 16/5/38.

FIG. 2.—First sign of new hair, 10/8/38.

Photos by the Baroness Wentworth.

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It was necessary to put the patient down for examination, and suspecting a polypus, I went a few days later to remove it. I also took tooth instruments on the chance that he might have a diseased molar.

Chloral was injected intravenously, two ounces in twenty-four of water, and he went down as I was putting the injector aside.

Sidelines had been placed on him in readiness, and he was tied up in the usual way. Gagging his mouth, I found the first two upper molars had large processes. One was chipped and the other failed and split. The tooth being rotten was easily extracted. Examining the pharynx, I found a large polypus. We examined several times. Sometimes it could be easily felt, at others only after a more prolonged search. This is often the case. They may be swallowed when the pharynx is touched with the fingers and held while the examination is on. In cattle they are easier found because the hand goes right in, but in a horse as big as this only fingers are passable through the fauces.

I could get the polypus in my fingers and feel that the pedicle was very broad. It appeared to be attached to the wall of the pharynx at the side of the epiglotis.

A long *écraseur* carrying a Bowden wire loop was used for the removal. Wire is better than a chain because the loop keeps its position and can be guided better.

It was not easy to get the tumour in the snare owing to it being withdrawn into the pharynx and the restricted area for operating. After one or two attempts I was able to get the wire round it and then the removal was easy. I passed my hand down just as the cutting-off process was finished and was able to secure it before the patient swallowed. The polypus was about as large as a hen's egg and was firm like a fibroid.

The injection of chloral hydrate was sufficient for the operation, though anæsthesia could not be described as complete.

The patient was up in about 45 minutes after the operation and can now feed satisfactorily.

ALOPECIA DUE TO ENDOCRINE DYSFUNCTION

By J. McCUNN

On May 16, 1938, a golden Pomeranian dog was presented for examination. There was a history of a gradual loss of hair over a period of about two years. At the time of examination the animal was almost completely denuded of hair. The skin was hard, dry and somewhat pigmented. The

owner thought that the loss of hair was a natural process, for the dog was nine years old. It was presented for examination on account of its testicles. They were both enlarged to the size of a goose's egg. They were tense and painful, and the scrotal skin was bruised. They interfered with walking or taking exercise. The enlargement had been gradual for some time, but during the few weeks prior to May 16, 1938, the swellings had rapidly increased in size.

In appearance the dog was an old decrepit animal.

A diagnosis of hyperplasia of the testicles and thyroid deficiency was made. It was decided to remove the testicles, for they were of such a size as to interfere with the dog's comfort. Removal was effected under local anæsthetic, for the general condition was such as to make one fear the effect of a general anæsthetic.

The left testicle was removed on May 16, 1938, and the right one six weeks later. Healing was rapid and good. In the meantime the dog was given daily Thyroid grs. iii (Armours).

Progress was remarkable, and through the kindness of the owner, the Baroness Wentworth, a series of photographs was made illustrating the changes in coat and condition.

These pictures show the ill effects of an endocrine dysfunction and how such may be corrected by the administration of extracts of the glands involved.

In a note to me dated January 27, 1939, Lady Wentworth states: " Puizer is now ten years old. He was bald for two years. He is in-bred an inveterate fighter, a keen rabbiter and he will retrieve any rabbit. I enclose a series of photographs showing progress from total baldness to luxuriant coat. His feathering behind is now five inches long."

I am indebted to Lady Wentworth for the excellent photographs and for her interest in this unique case.

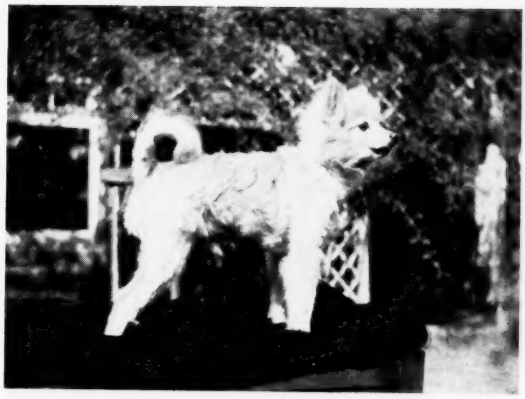

FIG. 3.—Progress continued, September, 1938.

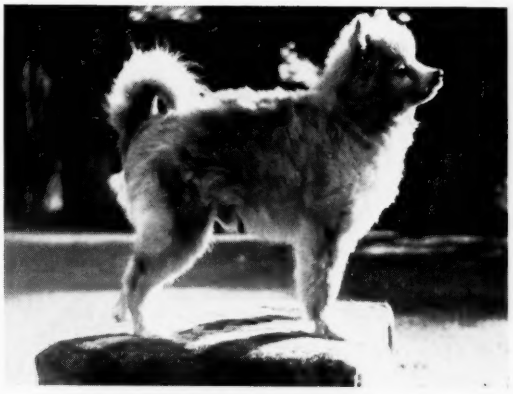

FIG. 4.—Progress continued, November, 1938.

Photos by the Baroness Wentworth.

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FIG. 5.—Progress continued, December 29, 1938.

FIG. 6.—Present condition, January, 1939.

Photos by the Baroness Wentworth.

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Abstracts

SULPHANILAMIDE AND CERTAIN RELATED COMPOUNDS IN EXPERIMENTAL INFECTIONS IN MICE

By W. HARRY FEINSTONE, B.S., ELEANOR A. BLISS, ScD., EARL OTT and PERRIN H. LONG, M.D.

The authors, in a report of their investigations made possible by a grant from the Chemical Foundations, Inc., of New York City, outlined certain minimal requirements necessary for the proper evaluation of old and new sulphur-bearing compounds. They also presented data regarding the rate of absorption, comparative toxicity and therapeutic efficiency of these substances. The following is an abstract of the investigations made, which were published in the Bulletin of the Johns Hopkins Hospital, *June,* 1938.

Australasian Pharmaceutical Notes and News, October 10, 1938.

THE introduction of "Prontosil," "Prontosil Solution" and sulphanilamide (1, 2, 3, 4, 5, 6) as therapeutic agents for the treatment of certain bacterial diseases has brought a renaissance in the study of chemotherapy. A natural result of the successful use of these original compounds has been the search —one might almost say the race—for new effective chemotherapeutic compounds.

The very nature of these advances, however, calls for the sober recognition of the fact that great care must be taken in evaluating the therapeutic and toxic effects of new chemotherapeutic agents. The recent reports of toxic effects of sulphanilamide in human beings definitely show that acute or chronic toxicity tests made with sulphur-containing compounds in animals are of little value in predicting the behaviour of these compounds in man.

Nevertheless, it is becoming increasingly important that all new chemotherapeutic agents be studied adequately in experimental animals before being introduced for clinical trials. While it may be impossible to predict toxic effects in human subjects from tests in laboratory animals, still there are many problems which may be clarified by animal experimentation. Among these are the relation of the absorption of a compound to its acute toxicity, the blood levels obtained following the administration of a compound, the disposal of the administered compound, and the breakdown or conjugation

of the compound. Relative therapeutic efficiencies of various compounds can be determined only in experimental infections in statistically significant numbers of laboratory animals. Only if adequate laboratory studies are made can one be spared the spectacle of evaluations of therapeutic efficiencies of new compounds which have been determined on statistically insignificant numbers of animals, of claims of non-toxicity for compounds which may be almost completely unabsorbed, and of computations of the therapeutic-toxic indices of new compounds, when actually no real information has been made available on either of the two components of the index.

A consideration of the data presented in this report brings out the following points of interest.

1. Sulphanilamide is a highly effective compound in the treatment of experimental streptococcal infections in mice. 4 : 4′ diamino diphenyl sulphone is more active in experimental streptococcal infections than is sulphanilamide, but is also highly toxic for mice. Di (acetylamino) diphenyl sulphone shows a degree of activity in experimental streptococcal infections in mice which warrants a careful clinical trial of this compound in hemolytic streptococcal infections in man. "Disulphanilamide," its dimethyl derivative, and para benzyl amino benzene sulphonamide show a moderate degree of activity in experimental streptococcal infections in mice.

2. Further experimental evidence indicated that the activity of "Prontosil Solution" is dependent on its reduction to sulphanilamide *in vivo*.

3. 4 : 4′ diamino diphenyl sulphone has a real degree of therapeutic activity in experimental types 1 and 2 pneumococcal infections. Its toxicity, in our opinion, precludes its use in human beings. Sulphanilamide, "disulphanilamide," the dimethyl derivative of "disulphanilamide," di (acetylamino) diphenyl sulphone and para benzyl amino benzene sulphonamide showed little or no therapeutic activity in experimental pneumococcal infections in mice.

4. In experimental meningococcal infections in mice, sulphanilamide "disulphanilamide," diamino diphenyl sulphone and di (acetylamino) diphenyl sulphone all showed about the same degree of therapeutic activity. The dimethyl derivative of "disulphanilamide" and benzyl amino benzene sulphonamide were definitely less active as therapeutic agents.

5. Sulphanilamide, "disulphanilamide" and its dimethyl derivative showed low degrees of activity in experimental staphylococcal infections in mice.

6. The reported lack of acute toxicity in mice given large doses of "disulphanilamide" is dependent upon the fact that the drug is not well absorbed. This is probably also true for other almost insoluble compounds.

7. The experimental data recorded in this paper indicate that sulphanilamide is from all points of view the most suitable compound for the treatment of hemolytic streptococcal and meningococcal infections in human beings. It is of doubtful value in pneumococcal and staphylococcal infections.

THE POLICY CONCERNING THE CONTROL OF STOMACH WORMS OF SHEEP IN EASTERN CANADA*

By W. E. SWALES
Institute of Parasitology, Macdonald College, P. Q.

Submitted on behalf of the sub-committee on diseases and parasites, National Sheep Committee

At the first meeting of the sub-committee on diseases and parasites, National Sheep Committee, held in Ottawa on June 27, 1938, under the chairmanship of Dr. A. E. Cameron, the policy to be recommended in regard to the control of *Hæmonchus contortus* in sheep, and the treatment of stomach worm disease, hæmonchosis, was carefully considered. It was agreed by the members that this pathogenic parasite is very prevalent in sheep flocks throughout Eastern Canada, that it is the cause of severe losses in many flocks and is in no small way responsible for lack of expansion in sheep production in the eastern parts of the Dominion.

Veterinary parasitologists in many parts of the world, and particularly in Australia and South Africa, have successfully demonstrated control measures which have proved to be of immense value to the sheep industry in those countries. However, due to greatly varying climatic conditions the epidemiology of parasitic diseases must be considered in each country, and in fact each part of each country, in order to determine effective means of control.

The main sheep-raising areas in Ontario, Quebec and in the Maritime provinces come under the influence of a relatively high summer rainfall and high summer temperatures; these areas are also subject to a long winter period. Thus we have conditions unlike those of any other part of the British Empire in that in spite of our winter months we have a period when conditions are ideal for the development of the larval stages of parasites of sheep which are usually considered as being " sub-tropical " in distribution. Our long winter destroys the free-living stages of these parasites, however, and thus we have a valuable ally in our measures of control. It happens that the two parasites of sheep that require high temperatures and high humidity for the completion of their life cycles are the only two which are constantly able to cause disease in well-nourished sheep in this part of the Dominion. These two species are the twisted-wire stomach worm

* *Canadian Journal of Comparative Medicine,* November, 1938.

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(*Hæmonchus contortus*) and the nodular worm (*Œsophagostomum columbianum*). The means of overwintering these species is, of course, as adults in the alimentary tract of their host, where they are not directly influenced by climatic conditions.

Recent experiments have demonstrated that we have several therapeutic measures that will effectively remove all adult stomach worms from the abomasum of sheep.

The essential characteristics of an anthelmintic dose which is designed to remove all or nearly all the parasites are as follows:

1. It must be small in volume.
2. It must stimulate the reflex closure of the œsophageal groove, ensuring the direct passage of the drug to the abomasum.
3. It must be easily and quickly administered.

A simple 2 per cent. aqueous solution of copper sulphate given in doses of two fluid ounces for an adult sheep meets the above requirements. However, by the addition of sufficient 40 per cent. nicotine sulphate to make the solution contain 1.5 per cent. of this chemical, the anthelmintic action is increased in the case of tapeworms (*Moniezia expansa*) and a large percentage of the small trichostrongyles are also removed. The readily visible effect of the mixture on tapeworms is not without value, particularly as this is the action that the owner will observe. Due to the ease of administration, to its proven efficacy, to its safety, and to the important fact that it does not require prior fasting of the animals, the treatment with 2 per cent. copper sulphate containing 1.5 per cent. nicotine sulphate is well suited to our needs. Ewes can be treated just after lambing, and before they go to pasture, thereby reducing the number of adult stomach worms that are able to infect the pastures to a minimum. Due to its simplicity, the treatment can be given to the adult sheep twice more, three times in all, during the grazing season, with a minimum of expense and labour, thereby weakening the life cycles of the stomach worms and tapeworms.

The lambs should be treated towards the end of June, and the treatments must be repeated at forty- or fifty-day intervals until the end of the grazing season.

There is some objection to the animals having ready access to drinking water immediately after the dosing is completed, because the efficiency of the dose is thereby lessened. However, due to the fact that they have not been fasted they will not readily seek water, particularly as our pastures in Eastern Canada are not usually very dry. Thus the only precaution that may be necessary is to hold them for an hour or so, if the dosing is done immediately adjacent to a supply of water; otherwise, they can be released on to the pasture directly.

A study of the viability of eggs present in the uteri of stomach worms and of the physiology of reproduction in these parasites shows that the number

of viable eggs that pass out on days immediately after treatment are no more numerous than they were on any day previous to the dosing. Even if they were more numerous it would be inadvisable to hold the animals in a limited area for two or three days because of the lack of proper nutrition and the danger of contacting a concentrated infection. The open pasture is the best place for the animals to retain resistance against disease, and as the treatments are measures of prophylaxis rather than a cure of disease, it is always inadvisable to upset the routine of good husbandry.

The fact that the dosing constitutes measures of prophylaxis rather than therapy brings us to the important question of who is going to conduct the routine treatments. It is the consensus of opinion of those interested in the health of sheep that it is the farmer's duty to adopt a simple routine to prevent stomach-worm disease. If we in Canada are going to encourage the production of healthy stock, then we must follow the lead of other countries in respect of stomach worms of sheep. We, as veterinarians, must know the methods which are best adapted to conditions in our country, and must be prepared to encourage the owners of sheep to use them to the best advantage. It is as impractical for the practitioner personally to undertake the routine treatments of all sheep and lambs in his district, as it would be for him to undertake all dipping operations, and yet these treatments *must* be carried out in all flocks in Eastern Canada. The solution seems to lie in co-operation between the farmer and the practitioner, and in a campaign to teach the farmers simple, safe and effective methods.

The sub-committee on diseases and parasites is preparing to issue a leaflet, which will be available to all livestock owners, in which the copper sulphate and nicotine sulphate treatment is described. In this leaflet the farmer is urged to seek the advice of his veterinarian in regard to the treatment and the preparation of the dose, and therefore the present article is designed to inform the members of our profession of this policy. In this way it is hoped that all veterinarians will be prepared to supply information and materials when requested.

The above-mentioned farmers' leaflet describes the preparation of the drench as follows:

Ingredients—

Crystals of copper sulphate (bluestone)	3 oz.
40 per cent. nicotine sulphate	2 fl. oz.
Soft (rain) or distilled water	1 Imp. gallon.

Be sure that the copper sulphate crystals are clear and blue; discard all the whitened crystals. Heat a quantity of the water in an enamel saucepan or any other vessel that is not bare metal; dissolve the copper sulphate in the water as it nears the boiling point. Now add the rest of the water and allow it to cool. The solution will keep indefinitely in a glass, earthenware

or enamelled container, but the 40 per cent. nicotine sulphate must not be added until immediately before use, as the mixture will not keep.

The Doses—

Ewes and rams in good condition ...	2 fl. oz.
Ewes and rams in poor condition ...	1½ fl. oz.
Well-grown lambs	1 fl. oz.
Smaller lambs	½-¾ fl. oz.

The practice of giving a poor lamb a little extra "because it needs it" is bad. Reduce the amount for such animals.

The proportion of each ingredient in the solution has been determined for special reasons. The amount of copper sulphate is the lowest proportion consistent with good results in stimulating the reflex closure of the œsophageal groove. The proportion of nicotine sulphate is somewhat lower than in drenches used in other parts of the Empire, but in this country we rarely encounter the disease caused by immense numbers of *Trichostrongylus spp.* which is known as "black scours." However, the amount of nicotine is adequate in keeping down the numbers of these tiny worms, and is very efficient in removing tapeworms. Also, the lower proportion of nicotine is advisable because this drug is readily absorbed from mucous membranes which have been lacerated by large numbers of *Hæmonchus contortus.* In parts of Western Canada it may be advisable to increase the proportion of nicotine to 3 fluid ounces in 1 Imperial gallon.

Farmers' methods of administering a drench to sheep have frequently caused the animal to inhale a quantity of the solution, with dire results. With this in mind, the leaflet describes a simple but very effective instrument made from a length of ½ inch diameter metal spring, which is inserted into a No. 9 rubber stopper. The spring is then firmly bound with insulating tape, which can be renewed from time to time. A number of ¼-pint cream or "Yogourt" bottles are then marked with a file at the ½ oz., 1 oz., 1½ oz. and 2 oz. levels, and the inner walls of the neck are roughened with a file. The rubber stopper can then be quickly and firmly inserted into the neck at the time of dosing. This simple device appears to eliminate danger of inhalation, and it delivers the dose at a speed which is satisfactory from physiological and practical points of view.

Stress is laid on the importance of not holding the head of the animal too high at the time of dosing. In order to ensure a position which enables the animal to swallow normally the operator is advised to stand over the animal, holding the neck between his legs. If an animal is refractory a slight pressure of the knees applied just behind its ears acts as an effective means of restraint. The mouth is then opened with the left hand and the spring tube inserted into the right side and over the tongue for a distance of about four inches. The animal is then encouraged, by a slight movement of the

bottle, to chew the tube, thus aiding deglutition. Three operators, one drenching, one preparing doses, and one catching the animals, can complete the treatment of one hundred sheep or lambs in an hour. Two or more hurdles in the corner of a pasture are usually sufficient for an enclosure. The animals are brought gently into the enclosure and are released one by one between the legs of the operator administering the dose. If the enclosure is built some distance from water the animals can be released directly on to the pasture.

As the investigational work on control of parasitic diseases of sheep continues, the veterinary profession in Canada will be informed of all progress made. In the case of nodular disease or œsophagostomiasis, the therapeutic measures will call for the active co-operation of veterinarians. The policy concerning this disease will be announced in a later number of the *Canadian Journal of Comparative Medicine.*

News

SIR FREDERICK HOBDAY PRESENTATION FUND

First £1,000 Subscribed for Proposed Chair of Comparative Medicine

THE new chairman of the Sir Frederick Hobday Presentation Fund—the object of which is the endowment of a Chair of Comparative Medicine in one of the universities—is Lorna, Countess Howe. One of the first to contribute to the Fund was His Royal Highness the Duke of Gloucester, K.G.

Among the professional supporters of the Fund are: Viscount Dawson of Penn, Lord Horder, Professor McCunn, M.R.C.S., L.R.C.P., M.R.C.V.S., and Mr. R. Chrystal Irving, F.R.C.V.S.

Baroness Burton is the honorary treasurer, and the honorary secretary is Mr. E. T. Cox, 3, St. John's Avenue, Putney, S.W.15 (Tel.: Putney 3283).

The first £1,000 has now been obtained by contributions from over 850 subscribers. When a sufficient sum is forthcoming the Chair will be open equally to graduates of both branches of medicine, human and veterinary,

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desirous of obtaining a doctorate degree. The specific line of study would be intercommunicable and analogous diseases of men and animals.

Other supporters of the Fund are: The Duke of Beaufort, the Duke and Duchess of Portland, the Earl of Lonsdale, the Earl of Rosebery, Viscount Leverhulme, Lord Southwood, Mr. A. F. B. Portman, Mr. J. V. Rank and Mr. Gordon Stewart.

DOGS AS AEROPLANE PASSENGERS

May Now Travel With Owners

SMALL dogs carried in baskets and accompanying their owners may now travel in the passenger compartment of aeroplanes, following a decision of the Traffic Committee of the International Air Transport Association, which has just concluded a conference in London.

Dogs carried in this manner will, however, be charged for at a percentage of the passenger's fare. They will not be carried as freight.

Big dogs, on the other hand, will always travel as freight, and are charged for at the appropriate freight rate. On Imperial Airways' European routes, for example (on which dogs and other pets are specially catered for), livestock is carried at the normal freight rates plus a special livestock fee of 50 per cent. (minimum 5s.) per consignment.

The description " small dogs " means lap-dogs, and also extends to terriers and other small breeds. The decision to allow them in the passenger cabin has been taken in view of the fact that some owners do not desire their pets to travel in the freight compartment.

They will now be able to have them in the cabin if they are prepared to pay the considerably heavier cost. The percentage of the passenger's fare to be paid has not been fixed, but whatever figure is decided upon, the cost will be greater than if carried as freight.

It is essential that these small dogs be provided with baskets so that no annoyance shall be caused to other passengers.

As a result of the decision taken by the Traffic Committee of the I.A.T.A., an air company may, if it desires, offer the facility forthwith. Ratification of the new ruling, however, will not take place until the plenary session of the I.A.T.A. next year.

In adopting this system the air companies are merely following the practice of the railways. A dog travelling with a railway passenger does so on a special ticket, and is not in the same category as a dog in the luggage van.

Reviews

Practical Anatomy of the Rabbit. An elementary laboratory text-book in mammalian anatomy. By The Late B. A. BENSLEY, Ph.D., formerly Professor of Zoology, University of Toronto. Sixth Edition. Revised and Edited by E. HORNE CRAIGIE, Ph.D., Associate Professor of Comparative Anatomy and Neurology, University of Toronto. London: The Oxford University Press, 1938. Price, 14s.

HAVING reached the sixth edition, this book evidently fulfils a demand, viz., a "step up" in the study of anatomy from fish, frogs, etc., to the more complex mammalia.

It is a guide to dissection in which the student can read in sufficient histology, physiology, etc., to make the subject more interesting and so help in its study.

The book is profusely illustrated, many being sectional, which aid, by showing better, the relation of the parts.

It is well printed—perhaps a little too beautiful to take to a dissecting room.

One often complains at the want of an index, but here one may grumble at too much index, for items are often paged seven and nine times without indicating the main description. Time is too precious these days to be wasted in following up a mere mention of an organ, etc. One wants to find the description easily, particularly when dissecting, for obvious reasons.

Veterinary Obstetrics. By DR. FRANZ BENESCH. English Translation edited by JOHN G. WRIGHT, F.R.C.V.S. Pp. ix + 258. Illustrated. Price 12s. 6d. London: Baillière, Tindall & Cox, 7 and 8, Henrietta Street, London, W.C.2.

MESSRS. BAILLIERE, TINDALL & COX have done another good service for the profession by the translation of Dr. Franz Benesch's original work on canine and bovine veterinary instruments, the English translation of which has been issued after being edited by Professor John G. Wright. The name of Dr. Franz Benesch, who is the Professor of Obstetrics and Director of the Obstetrical Clinic in the Veterinary High School, Vienna, is as well known to veterinarians in all parts of the world as it is to those of the German-speaking countries, and is a book which is most elaborately illustrated by 135 drawings of the various forms of dystocia which are to be met with by those who have

obstetrical practice, which falls to the lot not only of those who have large breeding studs and dairy herds in their veterinary charge, but also to the practitioners in all agricultural districts. It also contains plates of every modern instrument, including the especially useful one which bears Dr. Benesch's own name, and its perusal will give many hints not only to the students for examination purposes, but to the practitioner who is so often faced with conditions of difficulty in this troublesome type of case. No practitioner should be without this book.

Veterinary Helminthology and Entomology. By H. O. MONNIG, B.A., DR. Phil., B.V.Sc. Second Edition Illustrated. Pp. xviii + 409. Price 30s. London: Baillière, Tindall & Cox, 7 and 8, Henrietta Street, London, W.C.2.

PROFESSOR MONNIG has had exceptional opportunity at Onderstepoort for the study of the diseases of the domesticated animal caused by helminth and arthropod parasites, and appreciation of the work which he has given to the veterinary profession is shown by the fact that it has within four years reached the second edition. This present volume consists of some 400 pages, and is exceedingly clearly illustrated by some 264 photographs, which include not only the parasites of tropical countries, but those which are of vital interest to the veterinarians and agriculturists of every part of the world. For the students it is exceptionally valuable, and especially to those whose purpose it is to make this subject their research in future years. It is indeed a textbook which should be the standard for the guidance of the students in every college class of parasitology and a work of reference which should be not only in every veterinary library, but in every practitioner's bookshelf.